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Solar Energy South Africa

Wind power generation scenario analysis

Overview

What is a wind power scenario?

Scenarios are possible sets of random wind power inputs with definite probability [2, 3]. The generation of quality scenarios is essential to model wind power uncertainty in decision-making problems through a stochastic programming approach. Several methods have been proposed in the literature to generate wind power scenarios.

How can the wind power scenario generation method be improved?

The wind power scenario generation method can be further improved by incorporating the R-Vine copula and the multivariate time series forecasting model, which capture the asymmetrical tail dependency that occurs in wind generation without making any assumptions about distribution types.

How can a forecasting model be used to generate wind power scenarios?

The proposed method can be enhanced by applying adaptive and non-linear forecasting models with time-varying parameters to generate wind power scenarios. The proposed work could be extended to generate load, solar generation, and price scenarios for different power systems and electricity markets applications.

How to generate scenarios for wind power generation and market prices?

Jamali et al. utilized a roulette-wheel mechanism to generate scenarios for wind power generation and market prices using the Kantorovich distance index to reduce the number of scenarios . This method in has also been applied to establish the uncertainty model of wind power and load demand. 4. Evaluation of SG methods.

How are wind power scenarios generated?

The commonly used method for wind power scenario generation can be divided into two categories, namely parametric and non-parametric

approaches. Parametric approaches are based on the assumption about probability distribution and then scenarios are generated via sampling such as Monte Carlo sampling (MCS) or Latin Hypercube sampling (LHS).

How to model wind power uncertainty in decision-making problems?

The generation of quality scenarios is essential to model wind power uncertainty in decision-making problems through a stochastic programming approach. Several methods have been proposed in the literature to generate wind power scenarios. These are fundamentally categorized as path-based methods, movement matching, and internal sampling.

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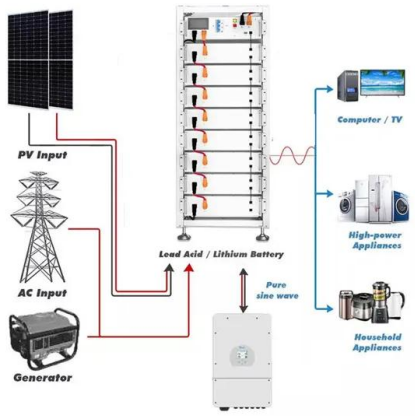

Feature Extraction Approach for Distributed Wind ...

This study addresses the integral role of typical wind power generation curves in the analysis of power system flexibility planning. A novel method is introduced for extracting these curves, integrating an enhanced K ...

Stochastic and Extreme Scenario Generation of Wind ...

This paper proposes a wind power stochastic and extreme scenario generation method considering wind power-temperature correlations and carries out probabilistic supply-demand balance analysis based on it.

A Morphing-Based Future Scenario Generation ...

As multiple wind and solar photovoltaic farms are integrated into power systems, precise scenario generation becomes challenging due to the interdependence of power generation and future climate change. Future ...

A Wind Power Scenario Generation Method Based on ...

To reflect the probabilistic characteristics of actual data, this paper proposed a scenario

generation method that can reflect the spatiotemporal characteristics of wind power generation and the probabilistic characteristics ...

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